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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,179	03/19/2004	Yoshiharu Ogata	81754.0117	7415
26021	7590	08/09/2005	EXAMINER	
HOGAN & HARTSON L.L.P. 500 S. GRAND AVENUE SUITE 1900 LOS ANGELES, CA 90071-2611			PIZARRO CRESPO, MARCOS D	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/805,179

**Applicant(s)**

OGATA, YOSHIHARU

**Examiner**

Marcos D. Pizarro-Crespo

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7, 8 and 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 10, 12, 13 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/19/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Attorney's Docket Number: 81754.0117

Filing Date: 3/19/2004

Claimed Foreign Priority Date: 3/27/2003 (JP 2003-088829)

Applicant(s): Ogata

Examiner: Marcos D. Pizarro-Crespo

### **DETAILED ACTION**

This Office action responds to the election filed on 7/29/2005.

#### **Election/Restrictions**

1. Applicant's election without traverse of claims 1-6, 9-13, and 17-20 in the reply filed on 7/29/2005 is acknowledged. Claims 7, 8, and 14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

#### **Priority**

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### **Drawings**

3. Figure 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the semiconductor device according to claim 11 wherein the radius of the global particle is practically equal to the thickness of the insulating spacer must be shown or the feature(s) canceled from the claim(s). According to figures 1-5, it is the diameter of the particle, not its radius,

which is practically equal to the thickness of the insulating spacer. No new matter should be entered.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters **44a** (see, e.g., par.0005/II.14) and **46a** (see, e.g., par.0005/II.12) have both been used to designate the same mirror chip.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character **44b** has been used to designate both an electronic pad (see, e.g., par.0005/II.5) and a semiconductor chip (see, e.g., par.0006/II.4).

7. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### **Specification**

8. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
9. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Claim 12 recites that the weight of the globular particles is within 1% through 10% the weight of the insulating spacer. The specification (see, e.g., par.0052) differently describes that the height, not the weight, of the globular particles is within 1% through 10% of the height of the insulating spacer. Appropriate correction is required.

### **Claim Rejections - 35 USC § 112**

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

11. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

12. The term "better" in claim 9 is a relative term that renders the claim indefinite. The term "better" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

### **Claim Rejections - 35 USC § 102**

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2814

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1, 2, 6, 9, 10, 13, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by LoBianco (US 6340846).

15. Regarding claim 1, LoBianco shows (see, e.g., fig. 7) all aspects of the instant invention including a semiconductor device **10** comprising:

- ✓ A substrate **20** having a terminal **26** to connect a conductive wire **38**
- ✓ A first semiconductor chip **14** mounted face-up above the substrate **20** and electrically connected to the terminal **26** by the wire **38**
- ✓ A second semiconductor chip **16** mounted above the first chip **14** via an insulating spacer **42**
- ✓ A solid material **48** contained in the spacer **42** to keep a distance between the chips **14/16** (see, e.g., col.6/ll.7-17)

16. Regarding claims 6 and 20, LoBianco shows that a size of the solid material is set corresponding to the distance between the chips (see, e.g., fig. 7, col.6/ll.7-17).

17. Regarding claim 9 and as indicated above in paragraph 12, the term "better" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. In paragraph 0052, the applicant discloses that the particles have a "better" elasticity than the semiconductor chip and gives polystyrene- and acrylic- resins as material examples for the particles. The elasticity of these materials is higher (*i.e.*, lower Young's modulus) than the average elasticity of the

semiconductor materials from which the semiconductor chips are made. Assuming that the applicant meant "lower" in his use of the term "better", then LoBianco shows that the elasticity ability of the solid materials is better than the elasticity of the semiconductor chip since he shows polytetrafluoroethylene (Teflon), which has a higher elasticity than the average semiconductor chip material, as one of his solid materials (see, e.g., col.6/ll.40).

18. Regarding claim 10, LoBianco shows (see, e.g., fig. 7) that the solid material is a globular particle.

19. Regarding claim 2, LoBianco shows (see, e.g., fig. 7) all aspects of the instant invention including a semiconductor device **10** comprising:

- ✓ A substrate **20** having a terminal **26** to connect a conductive wire **38**
- ✓ A first semiconductor chip **14** mounted face-up above the substrate **20** and electrically connected to the terminal **26** by the wire **38**
- ✓ A second semiconductor chip **16** mounted above the first chip **14** via an insulating resin **42**
- ✓ A solid material **48** contained in the resin **42** to keep a distance between the first and second chips (see, e.g., col.6/ll.7-17)

20. Regarding claim 13, LoBianco shows (see, e.g., fig. 7) all aspects of the instant invention including a semiconductor device **10** comprising:

- ✓ A substrate **20** having a terminal **26** to connect a conductive wire **38**
- ✓ A first electronic part **14** mounted face-up above the substrate **20** and electrically connected to the terminal **26** by the wire **38**

- ✓ A second electronic part **16** mounted above the first electronic part **14** via an insulating spacer **42**
- ✓ A solid material **48** contained in the insulating spacer **42** to keep a certain distance between the first **14** and the second **16** electronic parts (see, e.g., col.6/ll.7-17)

### **Claim Rejections - 35 USC § 103**

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 5, 12, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over LoBianco in view of Fukui (US 6657290).

23. Regarding claims 5 and 17, LoBianco shows most aspects of the instant invention (see, e.g., paragraphs 15 and 19 above), except for an insulating layer formed entirely on a back portion of the second chip. Fukui, on the other hand, teaches that providing said layer to LoBianco's second chip would prevent unwanted contacts to the first chip. In other words, said insulating layer would ensure the insulation of the first chip (see, e.g., Fukui/col.6/ll.25-35).

It would have been obvious at the time of the invention to one of ordinary skill in the art to form an insulating layer on the back of LoBianco's second chip, as suggested by Fukui, to ensure the insulation of the first chip.



24. Regarding claim 12, LoBianco shows most aspects of the instant invention (see, e.g., paragraph 18 above), except for the weight of the globular particles being within 1% through 10% the weight of the insulating spacer. LoBianco, however, shows solid globular particles contained within the insulating spacer. Although he fails to specify the weight of the particles, these will certainly have a weight that could be expressed as a percentage of the weight of the insulating spacer. It is also noted that the specification fails to provide any teachings about the criticality of having the globular particles weighing between 1% through 10% of the weight of the insulating spacer. Differences in concentration (weight percentage) will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentrations are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Since the applicant has not established the criticality (see next paragraph) of the claimed weight percentages, it would have been obvious to one of ordinary skill in the art to use these values in the device of LoBianco.

#### CRITICALITY

25. The specification contains no disclosure of either the critical nature of the claimed weight percentages or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

26. Claims 3, 4, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui in view of LoBianco.

27. Regarding claim 3, Fukui shows (see, e.g., fig. 4) most aspects of the instant invention including a semiconductor device comprising:

- ✓ A substrate **7** having a terminal
- ✓ A first semiconductor chip **2** mounted face-up above the substrate **7**
- ✓ A first electrode pad formed on the first chip **2**
- ✓ A first conductive wire **4** electrically connecting the first pad and the terminal
- ✓ A second semiconductor chip **1** mounted above the first chip **2**
- ✓ A second electrode pad formed on the second chip **2**
- ✓ A second conductive wire **3** connecting the second pad and the terminal
- ✓ An insulating resin **6** formed between the first **2** and the second **1** chips wrapping the first wire **4** above the first chip **2**
- ✓ Molding resin **15** to mold the first **2** and second **1** chips

Fukui, however, fails to show a solid material contained in the insulating resin to keep a distance between the first and the second chips. LoBianco, on the other hand, teaches that providing a solid material contained in the insulating resin would provide Fukui with an inexpensive and simple mechanism for precisely controlling the final thickness of the insulating resin, *i.e.*, the distance between the chips (see, e.g., LoBianco/col.6/ll.7-17).

It would have been obvious at the time of the invention to one of ordinary skill in the art to provide Fukui's insulating resin with the solid material that LoBianco suggested to obtain an inexpensive and simple mechanism for precisely controlling the distance between the chips.

28. Regarding claims 18 and 19, Fukui shows (see, e.g., fig. 4) an insulating layer 5 formed entirely on a back portion of the second chip 1.

29. Regarding claim 4, Fukui shows (see, e.g., fig. 4) a semiconductor device comprising:

- ✓ A substrate 7 having a terminal
- ✓ A first semiconductor chip 2 mounted face-up above the substrate 7
- ✓ A first electronic pad formed on the first chip 2
- ✓ A first conductive wire 4 electrically connecting the first pad and the terminal
- ✓ A second semiconductor chip 1 mounted above the first chip 2
- ✓ A second electrode pad formed on the second semiconductor chip 1
- ✓ A second conductive wire 3 electrically connecting the second pad and the terminal
- ✓ An insulating resin 6 mounted between the first 2 and second 1 chips and being at least under the second pad

Fukui, however, fails to show a solid material contained in the insulating resin to keep a distance between the first and the second chips. LoBianco, on the other hand, teaches that providing a solid material contained in the insulating resin would provide Fukui with an inexpensive and simple mechanism for precisely controlling the final thickness of the insulating resin, *i.e.*, the distance between the chips. See, e.g., LoBianco/col.6/ll.7-17)

It would have been obvious at the time of the invention to one of ordinary skill in the art to provide Fukui's insulating resin with the solid material that LoBianco suggests

to obtain an inexpensive and simple mechanism for precisely controlling the distance between the chips.

### **Allowable Subject Matter**

30. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### **Conclusion**

31. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

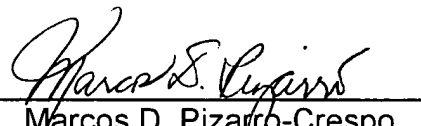
32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(571) 272-1716** and between the hours of 9:30 AM to 8:00 PM (Eastern Standard Time) Monday through Thursday or by e-mail via [Marcos.Pizarro@uspto.gov](mailto:Marcos.Pizarro@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (571) 272-1705.

33. Any inquiry of a general nature or relating to the status of this application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or

Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

34. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/777	8/7/2005
Other Documentation:	
Electronic Database(s): EAST (USPAT, EPO, JPO)	8/7/2005

  
Marcos D. Pizarro-Crespo  
Patent Examiner  
Art Unit 2814  
571-272-1716  
[marcos.pizarro@uspto.gov](mailto:marcos.pizarro@uspto.gov)